

Peritoneal Dialysis

Dr. Osama El-Shahat

Consultant Nephrologist

Head of Nephrology Department

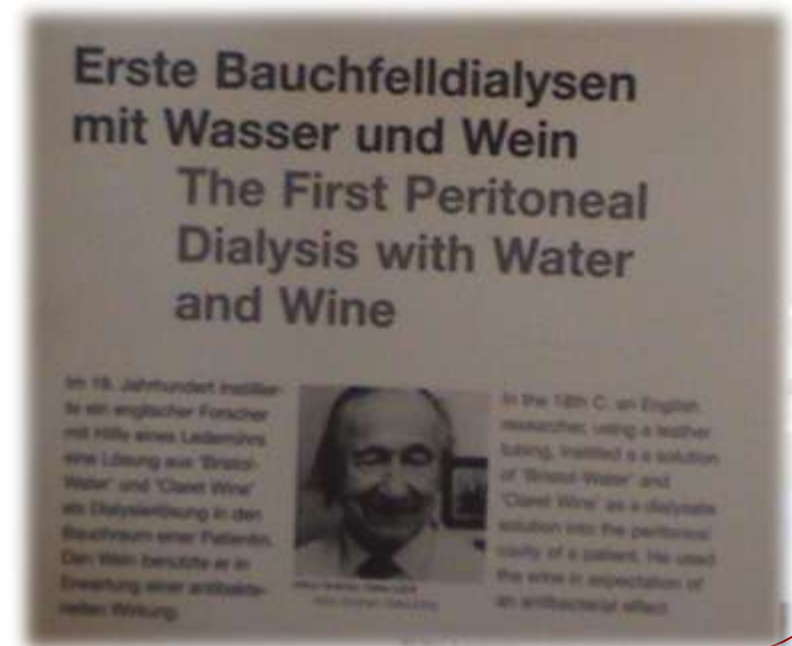
New Mansoura General Hospital (international)

(Egypt)



1st steps towards peritoneal dialysis.

The word peritoneum refers to the Greek word “**peritononion**” and means to stretch. Ancient Egypt were probably the first people to get a look at the peritoneum



Integrated Renal Care: The Concept

*Timely
referral*

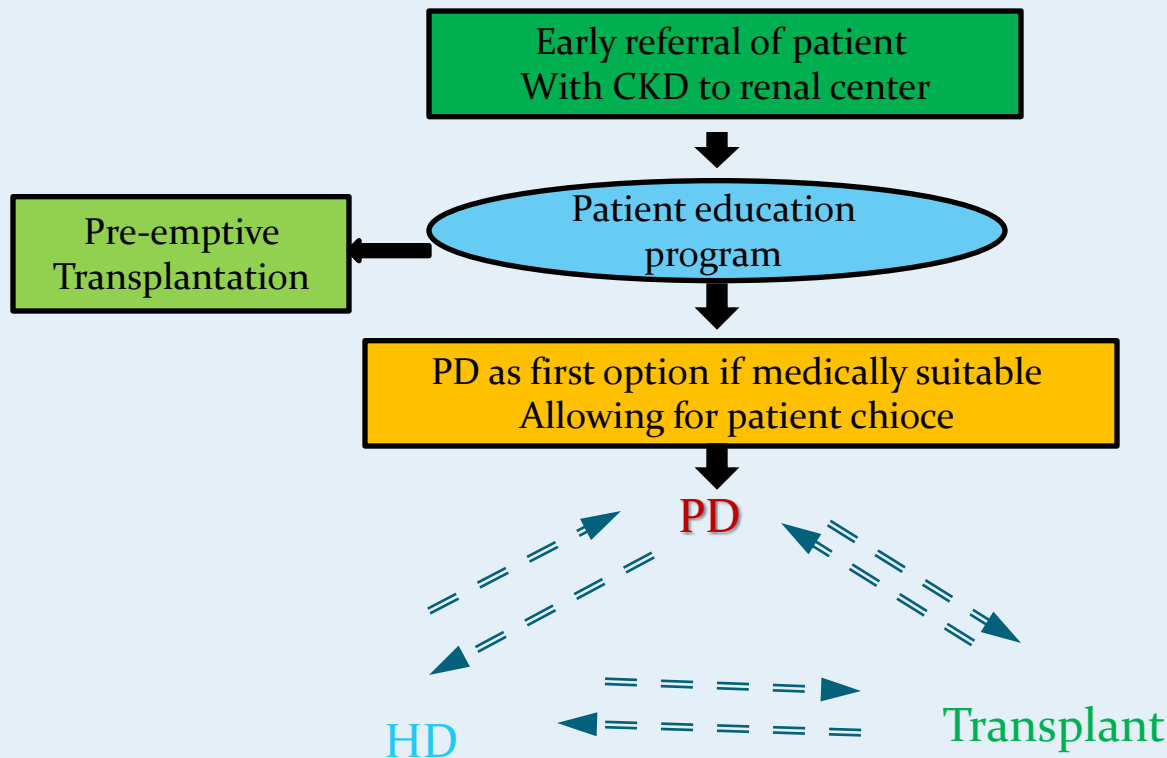
*Timely
preparation*

*Timely
Initiation*

*Best sequence of
PD, HD and TX*

*Therapy
management*

*Therapy
transfer*



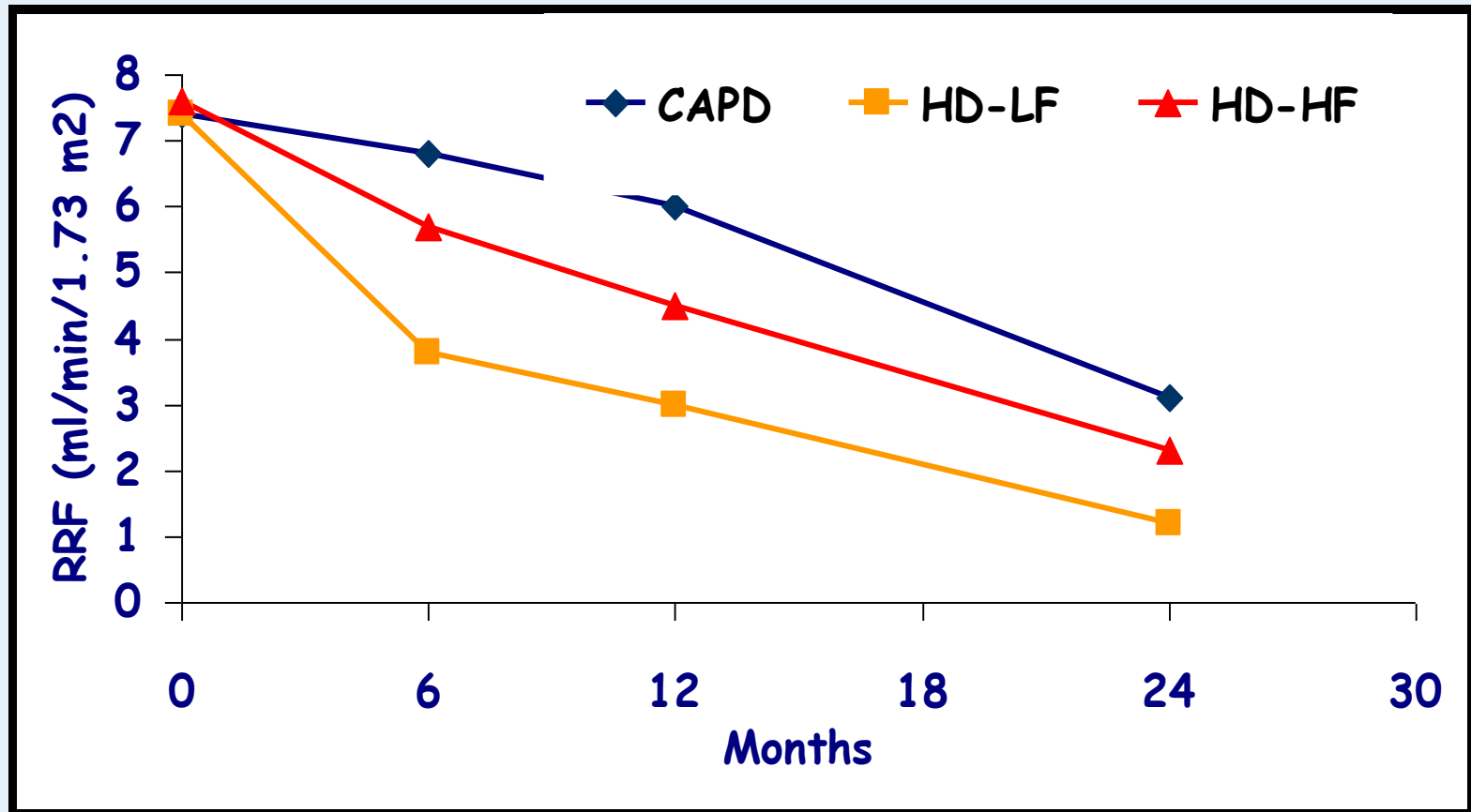
“Complementary Not Competitive” Coles 1998

“The right modality at the right time.” Peter Blake, MD, John Burkart, MD

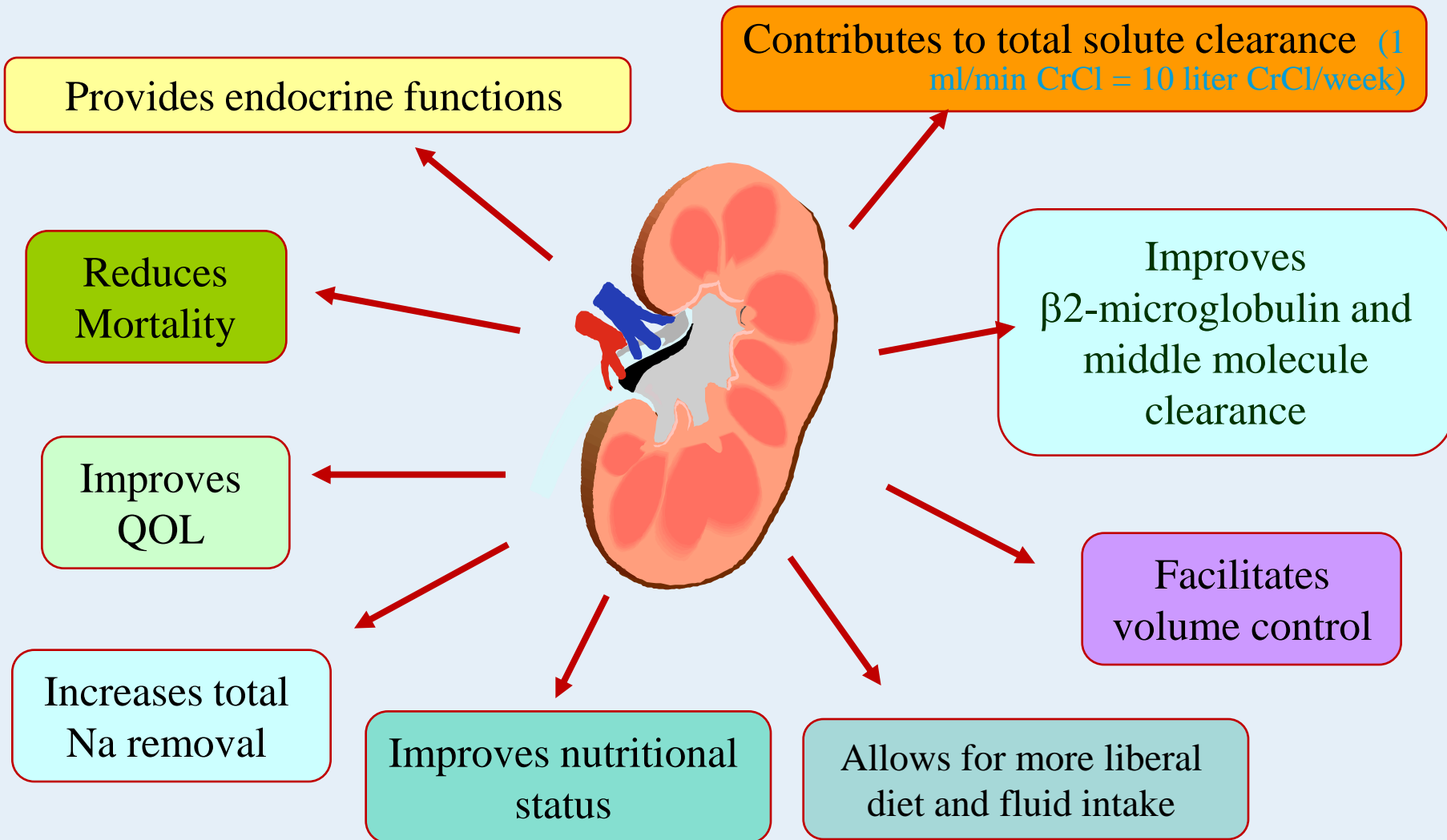
Advantages of PD

- Preservation of RRF
- Higher Hb concentration
- Less risk of acquiring blood borne infections e.g. HCV
- Better quality of life
- Travel , employment
- It allows expansion with limited resources
- Lower staff / patient ratio
- saves vascular access
- preferred for children (APD)

Preservation of residual renal function in CAPD, low flux & high flux HD



What Are the Benefits of Preserving RRF?

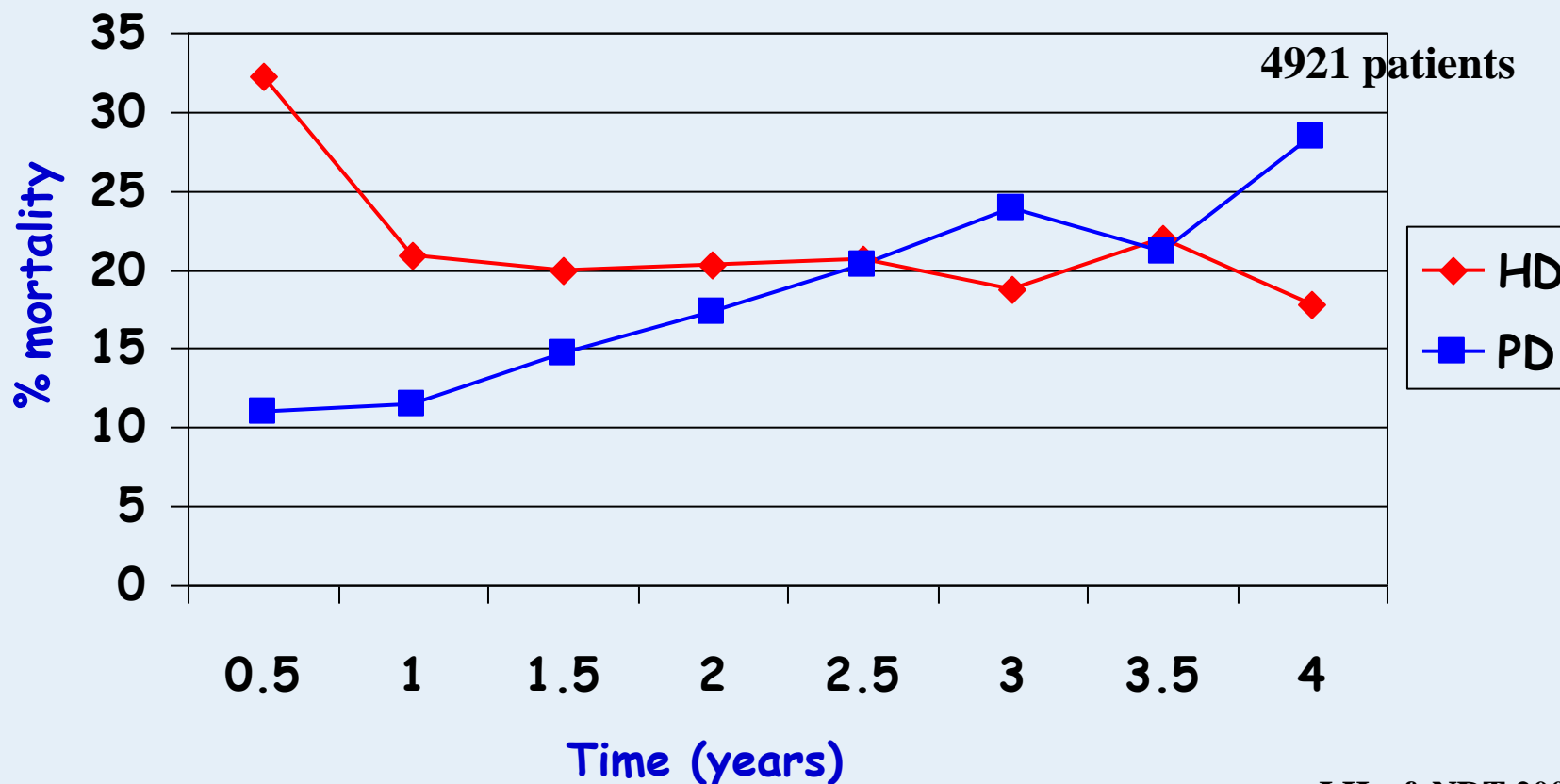


Initial Survival advantage of PD over HD

(for the first 2 years from ESRD)

PD Patients Have an Initial Survival Advantage Relative to HD.

Danish Registry 2001



Comparing Mortality of Peritoneal and Hemodialysis Patients in the First 2 Years of Dialysis Therapy: A Marginal Structural Model Analysis

Lilia R. Lukowsky,^{†} Rajnish Mehrotra,[‡] Leeka Kheifets,[†] Onyebuchi A. Arah,^{†§||} Allen R. Nissenson,^{¶**} and Kamyar Kalantar-Zadeh^{*†¶}*

Conclusions

Peritoneal dialysis seems to be associated with 48% lower mortality than hemodialysis over the first 2 years of dialysis therapy independent of modality switches or differential transplantation rates.

Preservation of Vascular Access



Things to Remember

- **ESRD is life-long ordeal**
 - Access problems
 - Higher morbidity and mortality
- **Survival lines**
 - One PD membrane
 - 4 sites for permanent vascular access
 - Two iliac for transplantation

Hospitalisation in the First Year of RRT for ESRD.

Metcalfe Et Al. Q J Med 2003; 96: 899

Prospective study of 526 incident patients starting RRT. 1 year follow up. Univariate analysis:

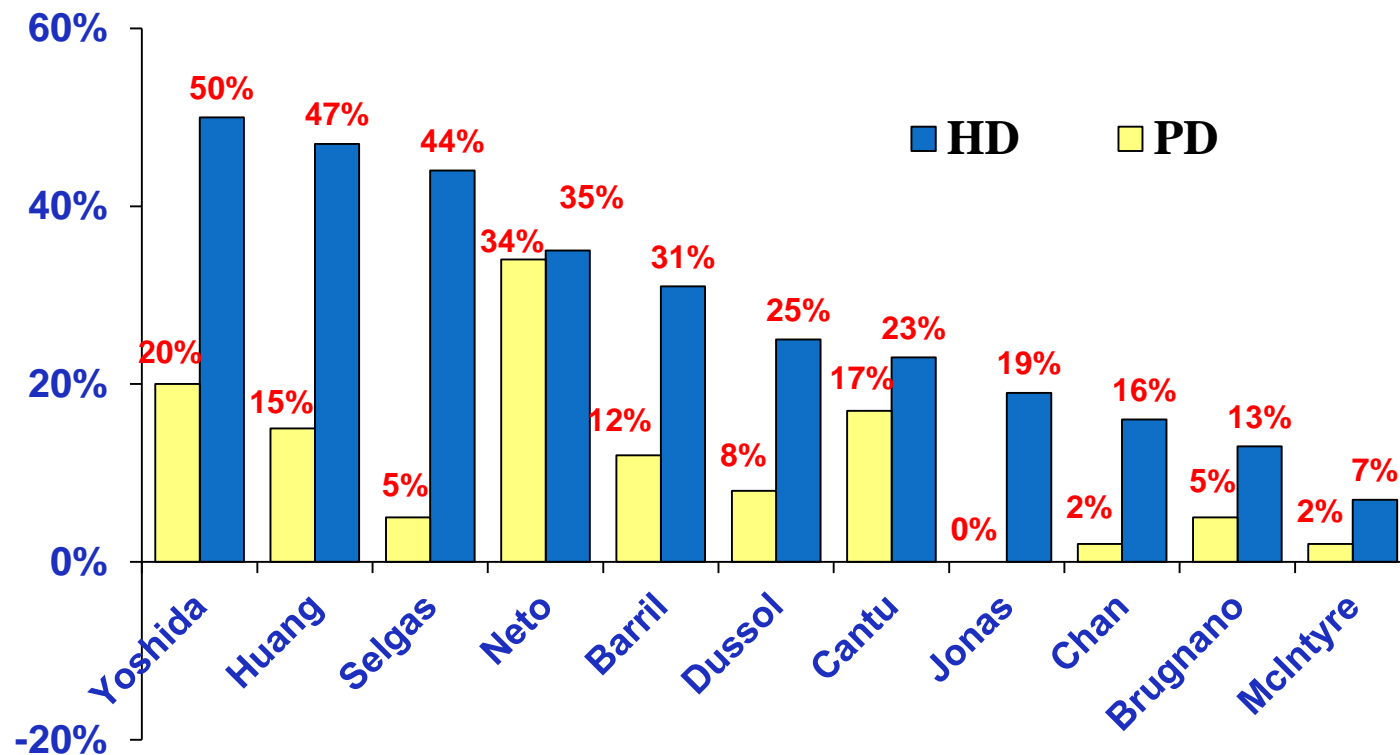
- The most common single reason for admission was creation of & complications to vascular access for HD.
- The use of temporary vascular access for HD were associated with prolonged hospitalisation & repeated admissions.
- Patients initially treated with HD rather than PD spent longer time in hospital & were more likely to be admitted.

Total Lifespan of Vascular Access

- Creation and maintenance of adequate vascular access remains a major problem in HD
- Any strategy that can augment the total lifespan of vascular access is of value
 - **Additional time is “won” by starting PD**

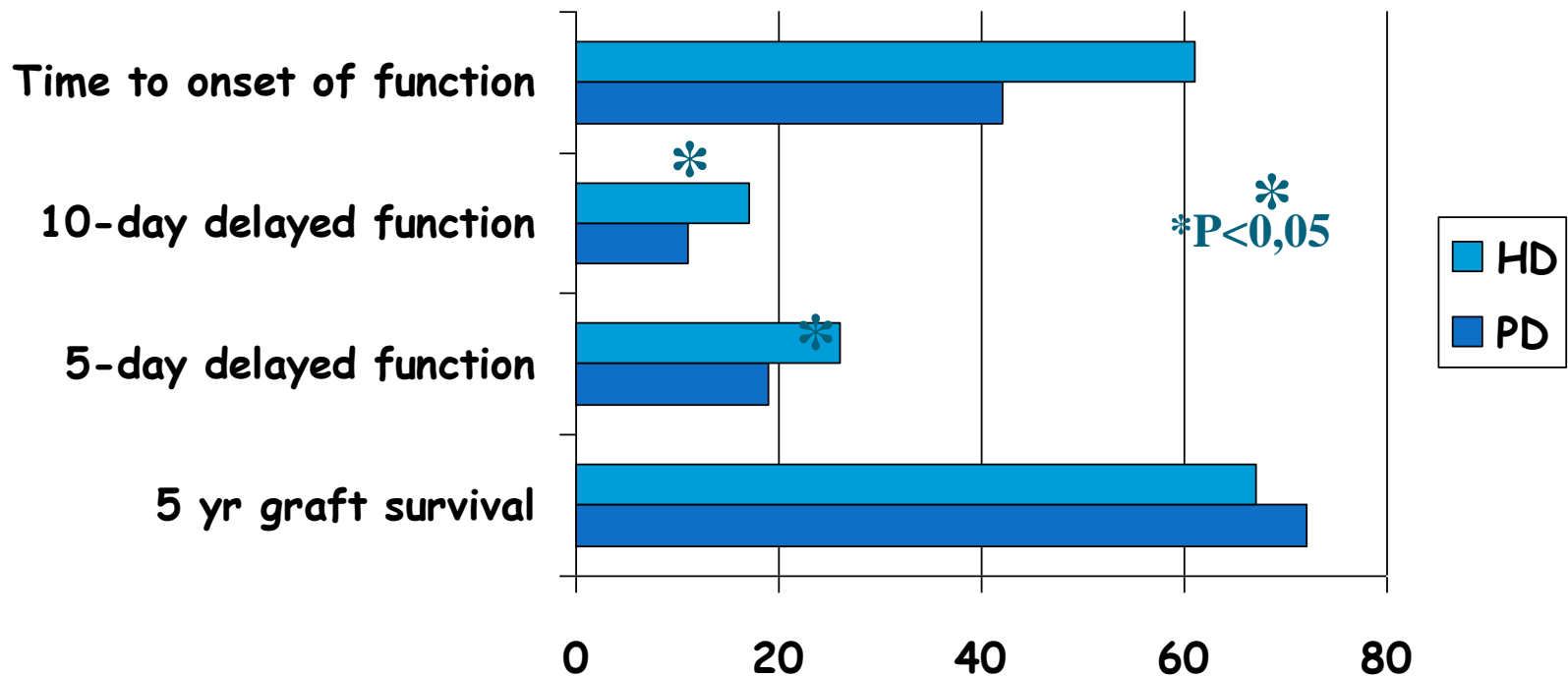
Risk of **HCV** transmission is the highest with **HD** (*especially in this part of the world*)

Prevalence of *anti-HCV* Among Patients on Dialysis by Modality



Transplantation *After* PD Vs HD

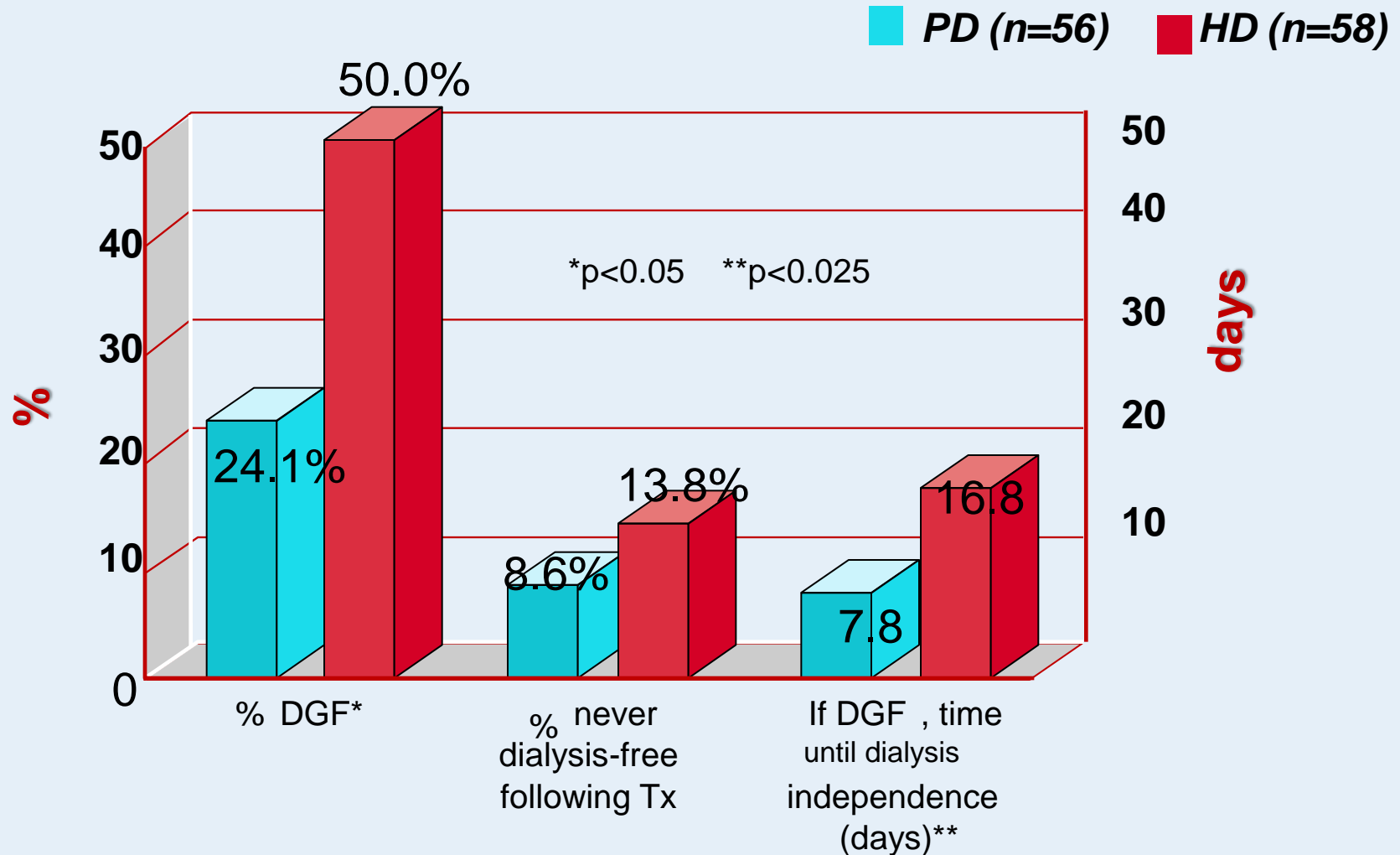
Results After Kidney Tx: Danish Registry 1990-1999



Tx:1397, HD:877, PD:520

J. Heaf NDT 2002

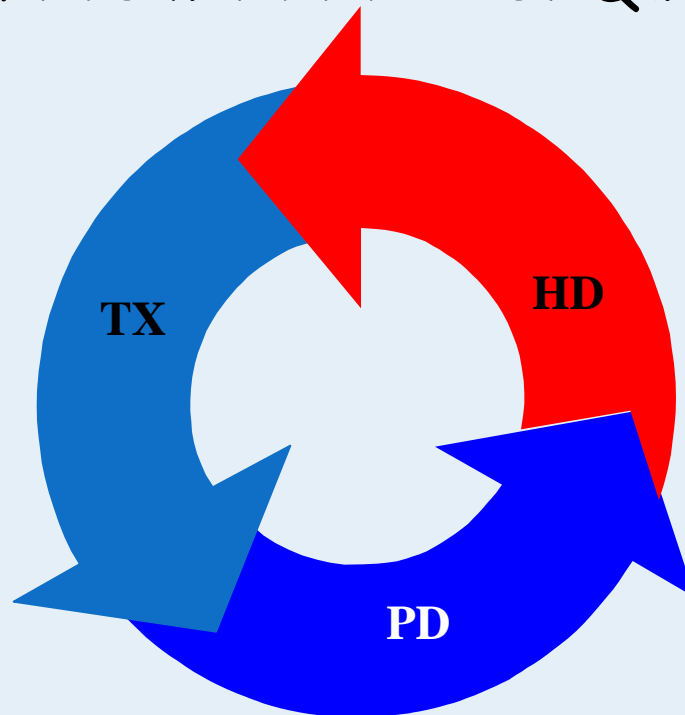
Effect of Dialysis Modality on Initial Graft Function



Better Quality of Life

Total Survival Is More Important Than Survival on Each Therapy

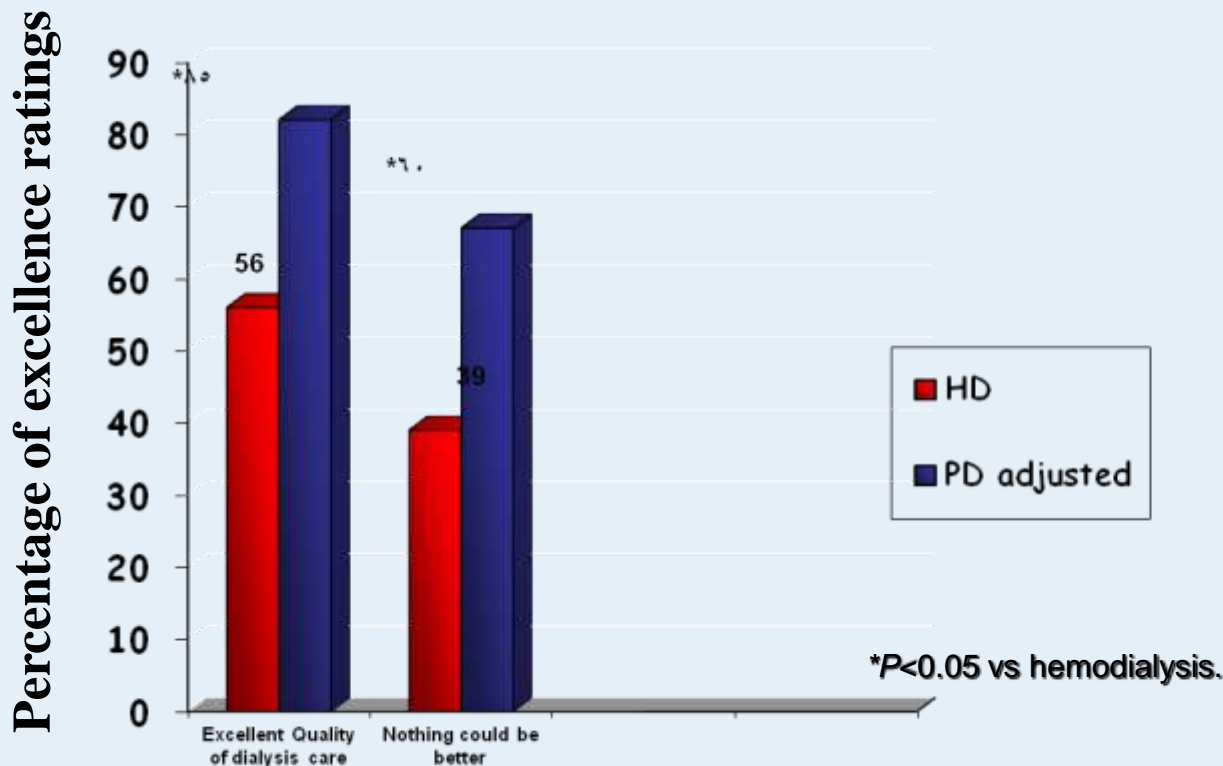
"What patients want to know is which sequence of RR modalities will increase their survival as long as possible & this with the best Quality of Life"



Van Biesen 2000

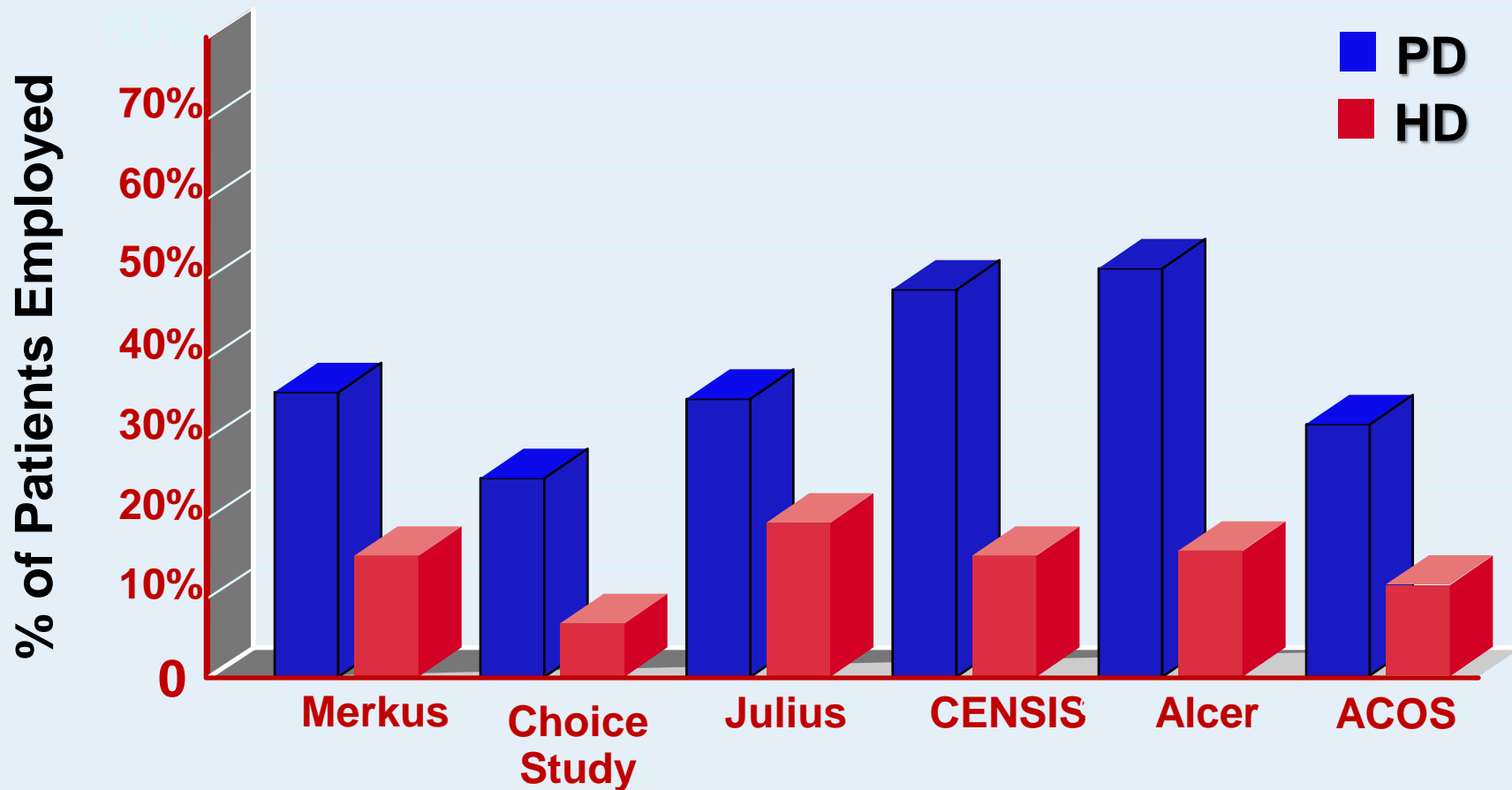
Patient Ratings of Dialysis Care*

Study Results :- Overall Care Ratings



*Rubin, et al: *JAMA* 2004;291:697-703

Lifestyle Flexibility: Employment



% of patients employed within modality group

Merkus M, *et al.*: *Am J Kidney Dis*, 1997. Powe, N. RPA/REF Annual Meeting, 1997. Julius M, *et al.*: *Arch Intern Med*, 1989. CENSIS, Italy, 1997. ALCER, Spain, 1997. ACOS, Germany, 1996.

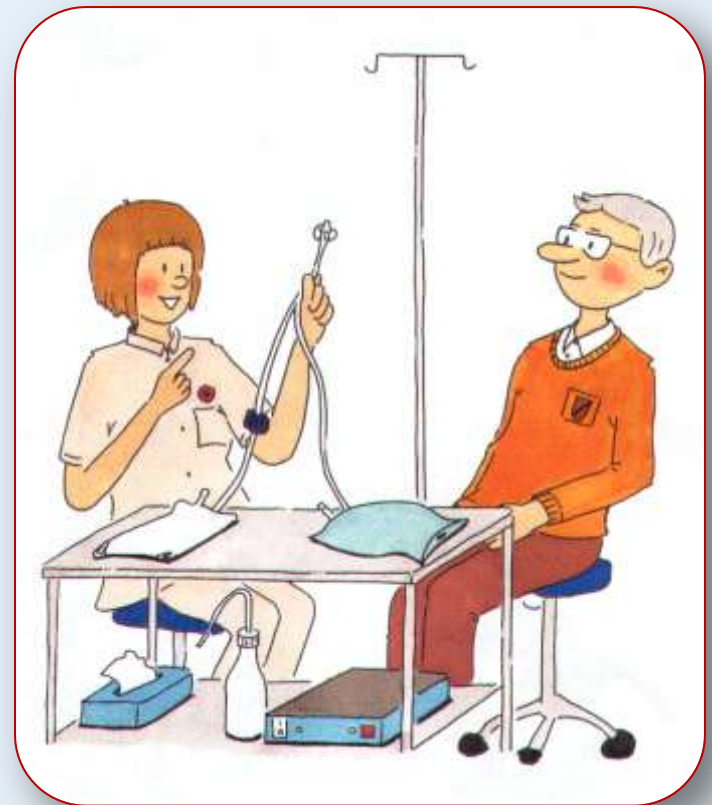
Logistics of PD versus HD

Logistics of PD versus HD

40 Nurses per **100** HD-patients.

4 Nurses in the Out-patient Clinic per **100** PD-patients.

Saving **36** nurses



Advantages of PD in AKI

- **Simple technique**
- **No anticoagulation**
- **low risk of bleeding**
- **Hemodynamically unstable patients**
- **low risk of electrolyte disorders**
- **less expansive than CRRT**

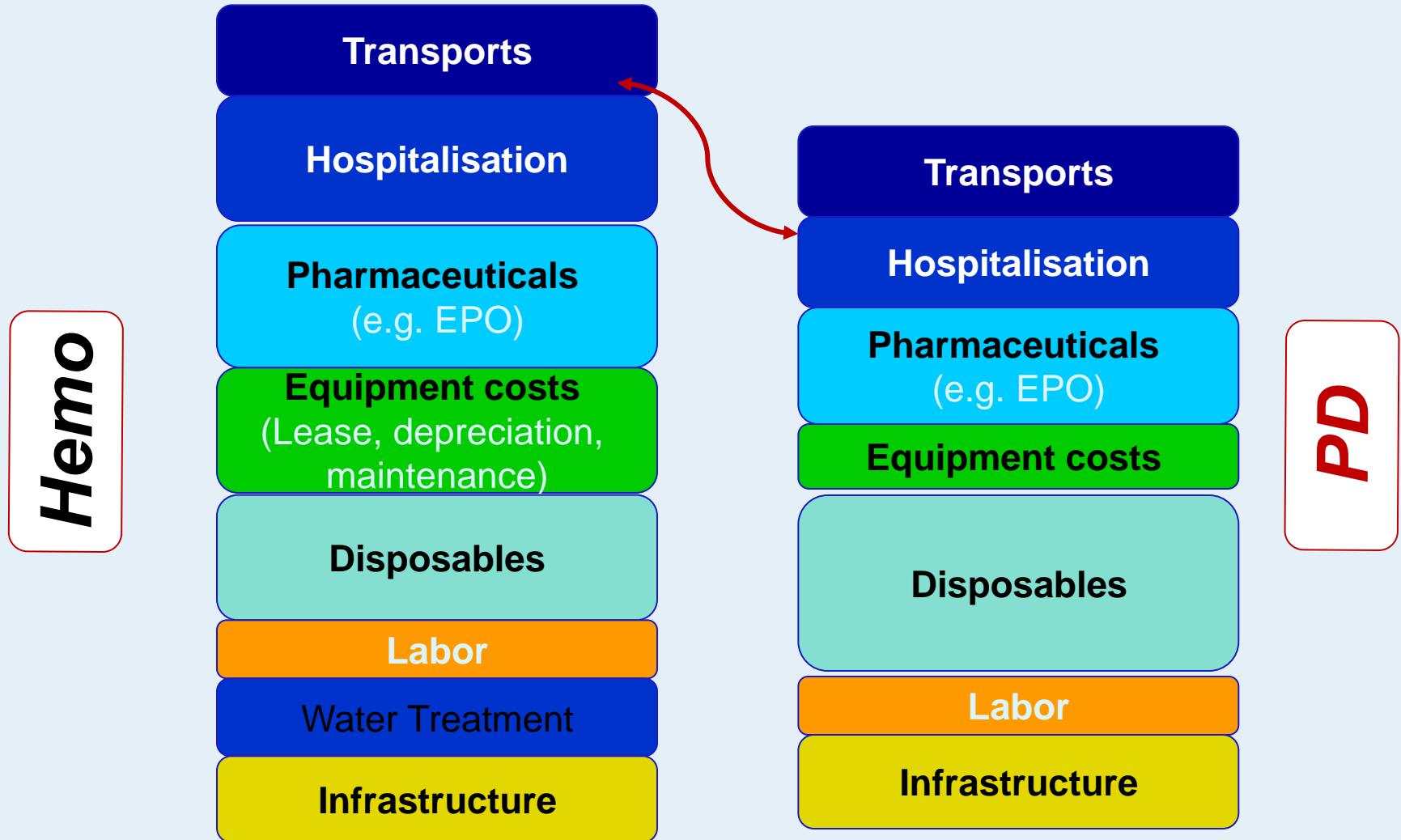
Use of Peritoneal Dialysis in AKI: A Systematic Review

Chang Yin Chionh,^{†} Sachin S. Soni,^{*‡} Fredric O. Finkelstein,[§] Claudio Ronco,^{*||} and Dinna N. Cruz^{||¶}*

Conclusions

There is currently no evidence to suggest significant differences in mortality between peritoneal dialysis and extracorporeal blood purification in AKI. There is a need for good-quality evidence in this important area.

Schematic RRT Cost Comparison Available Modalities



Modality Cost Comparison in KSA

Modality cost comparison - Hemo / PD cost to the health budget / Kingdom of Saudi Arabia

HEMO

	cost per patient / year US \$
Labor costs (salary, fully loaded)	6'500
Hardware (depreciated over 5 years)	2'440
consumables (HD equipment related)	4'992
Other expenses (Lab and X-ray, Meals, Rent, complication management, access costs, etc.)	3'920
Expenses beared within different budgets (water treatment costs, hospital/shared service charges etc.)	1'250
Total costs (excl. Pharam)	19'102
<u>Pharmaceutical costs</u>	
EPO costs	}
HepC treatment costs (on the bases of all Hemo pts dialysed)	
I.V. iron costs (pending)	
vitamine costs (pending)	
other pharmaceuticals (pending)	
	3'725
Total costs	22'827

PD

	cost per patient / year US \$
Labor costs (salary, fully loaded)	2'560
Hardware (depreciated over 5 years)	0
consumables (PD solutions)	14'667
Other expenses (Lab and X-ray, Meals, Rent, complication management, access costs, etc.)	400
Expenses beared within different budgets (water treatment costs, hospital/shared service charges etc.)	225
PD specific expenses	100
Total costs (excl. Pharma)	17'952
<u>Pharmaceutical costs</u>	
EPO costs	}
HepC treatment costs	
I.V. iron costs (pending)	
vitamine costs (pending)	
other pharmaceuticals (pending)	
	2'568
Total costs	20'520

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NDT
Nephrology Dialysis Transplantation

Cost of peritoneal dialysis and haemodialysis across the world

Akash Nayak Karopadi^{1,2},

Giacomo Mason¹,

Enrico Rettore³

and Claudio Ronco^{1,4}

¹International Renal Research Institute Vicenza (IRRIV), San Bortolo Hospital, Vicenza, Italy,

²Departments of Chemical Engineering and Economics, BITS Pilani, Rajasthan, India,

³Facoltà di Economia, Università degli Studi di Padova, Padova, Italy and

⁴Department of Nephrology, Dialysis and Transplantation, San Bortolo Hospital, Vicenza, Italy

Africa

Country	Year	No. Studies	Final HD/PD cost ratio
Nigeria	2011	1	0.70
Senegal	2010	1	1.38
South Africa	2010	1	0.58
Sudan	2010	1	0.89
Kenya	2010	1	1.33
Egypt	2010	1	0.22

Europe

Country	Year	No. of studies	Final HD/PD cost ratio
Spain	2011	2	1.40
Austria	2011	1	1.68
France	2011, 2007	5	1.51
Belgium	2010	1	1.25
Finland	2009	2	1.38
Romania	2009	1	1.45
UK	2008	8	1.94

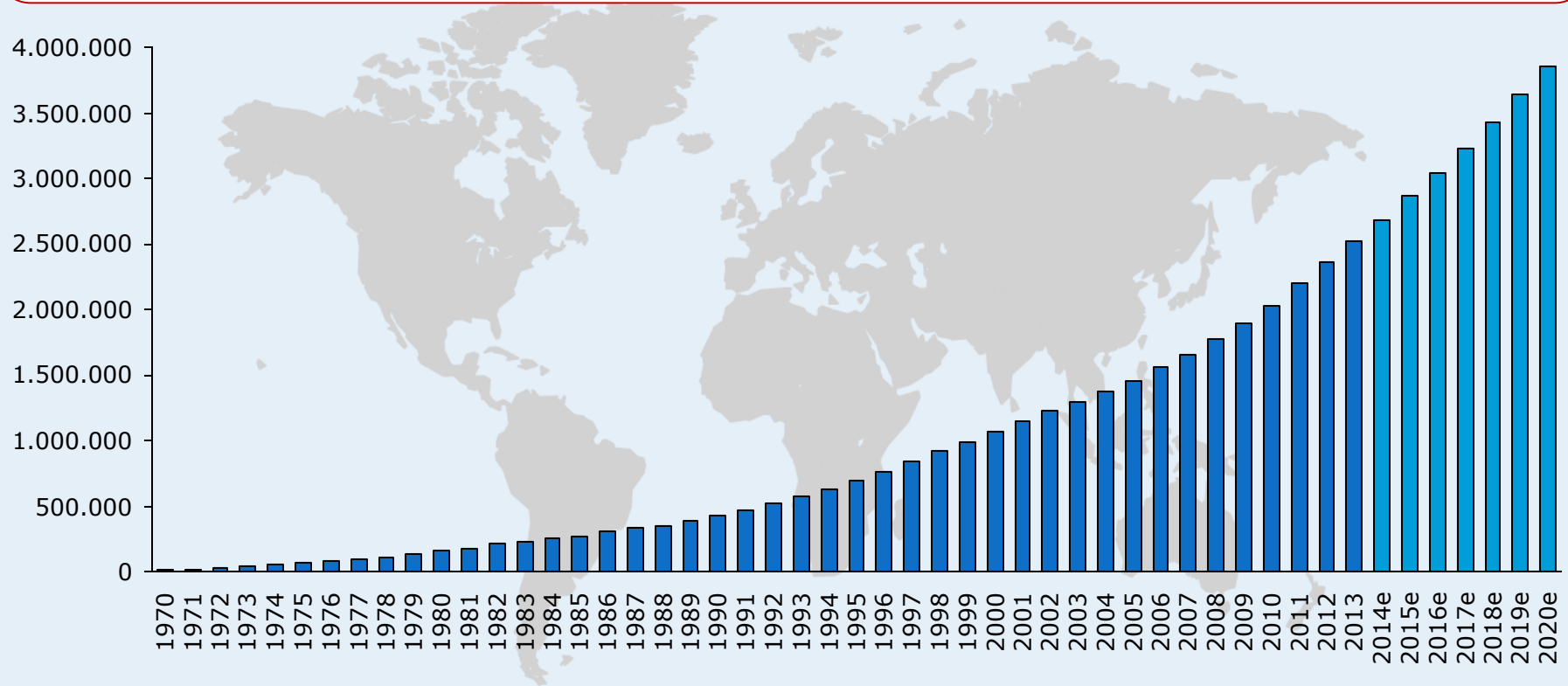
Asia and Middle East

Country	Year	No. of studies	Final HD/PD cost ratio
India	2013, 2012	2	1.08
Iran	2010	1	1.08
China	2009	1	1.16
Thailand	2009, 2007	2	1.10
Singapore	2009	1	1.38
Pakistan	2008	1	0.81

Latin America

Country	Year	No. of studies	Final HD/PD cost ratio
Brazil	2012, 2010	2	0.93
Argentina	2011	1	1.00
Chile	2009, 2007	2	1.03
Mexico	2009	2	1.53
Uruguay	2009	1	0.81
Colombia	2009	1	1.00

General expectation of exponential development of dialysis patient numbers remains unchanged

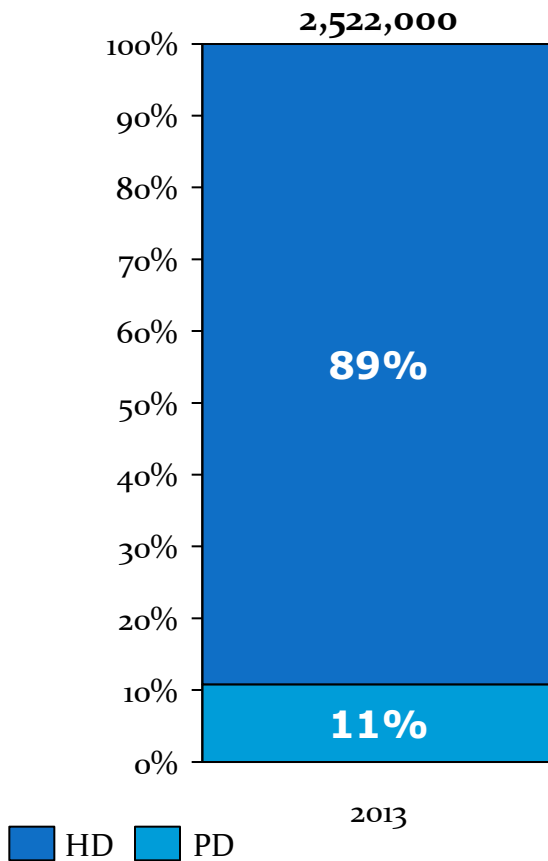


➤ **3,860,000 dialysis patients forecasted for 2020**

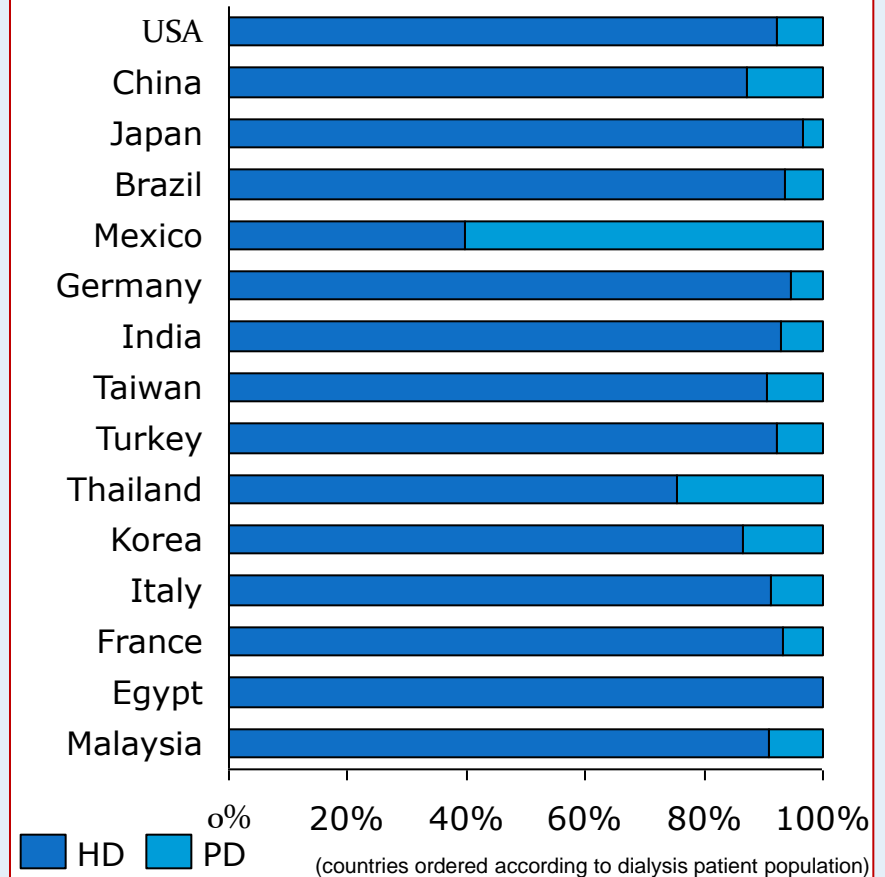
11% of all dialysis patients are treated with PD

PD distribution differs significantly between countries

Global dialysis patients



HD – PD patient distribution



Peritoneal Dialysis First: Rationale

Kunal Chaudhary,^{*†} Harbaksh Sangha,[†] and Ramesh Khanna[†]

Conclusions

In conclusion, PD continues to be underutilized in many countries, including the United States. There are many factors that contribute to this underutilization (e.g., *modality-, system-, and patient-related factors*).

Several of these factors are modifiable, and with a concerted effort PD utilization can be increased.

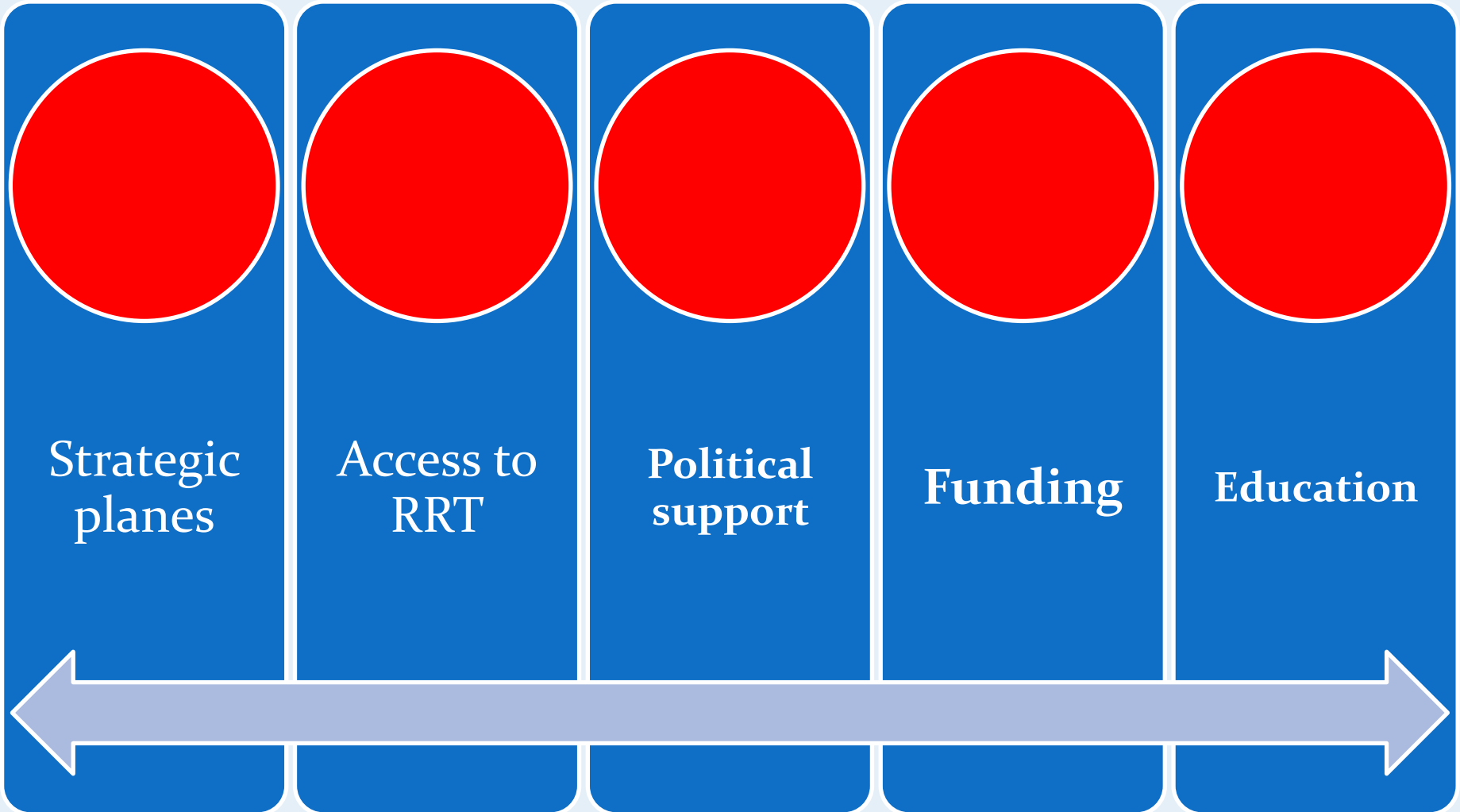
Patient and physician education and comfort with using this modality are critical. Techniques to prevent and minimize episodes of peritonitis, use of more biocompatible solutions in preserving the peritoneal membrane, and careful management of volume status can sustain the patient on PD. Use of drugs such as angiotensin converting enzyme inhibitors and angiotensin receptor blockers can preserve the membrane longer. Timely radiologic and surgical interventions can prevent the malfunction and loss of PD catheters.

Psychologic help and assisted PD with home aides can minimize the phenomenon of burnouts. Finally, one also hopes that with the introduction of bundling of services for dialysis care into one payment, PD would offer a cost-effective therapy and generate a renewed interest in the dialysis community resulting in an initiative of PD first.

Dialysis centers and staff numbers

Items	MOH	Private & Org	Health Insurance	University	Military	Total
Dialysis centers	265	210	25	40	9	549
Patients	18,400	7,000	3,200	3,500	850	32,950
Doctors	550	230	50	120	11	961
Nurses	3,500	1,700	650	1,200	280	7,330

Challenges and Solutions





**PD
Program
in
NMGH**



Conclusion

- ❖ *Integrated care approach is the optimal treatment for ESRD*
- ❖ *PD is the modality of choice to start RRT if kidney Tx not available.*
- ❖ *PD is the solution for overcrowded dialysis units*
- ❖ *PD is underutilize, more effort from nephrologists , government and local companies to support PD program.*

- ❑ **Good** things come to those who believe,
- ❑ **Better** things come to those who are patient,
- ❑ **Best** things come to those who don't give up.

Life wisdom

*Thank
You*



Peritoneal Dialysis—First Policy Made Successful: Perspectives and Actions

Philip Kam-tao Li, MD, FRCP, and Kai Ming Chow, MBChB, FRCP

Peritoneal dialysis (PD) represents an important but underused strategy for patients who are beginning dialysis treatment worldwide. The development of a health care model that encourages increased use of PD is hampered by a lack of expertise and absence of pragmatic strategies. This article provides a brief review of a PD-first initiative that was implemented in Hong Kong more than 25 years ago and issues related to this policy. Clinical studies and research by the authors' and other teams around the world have shown evidence that, as a home-based dialysis therapy, PD can improve patient survival, retain residual kidney function, lower infection risk, and increase patient satisfaction while reducing financial stress to governments by addressing the burden of managing the growing number of patients with end-stage renal disease. Achieving a successful PD-first policy requires understanding inherent patient factors, selecting patients carefully, and improving technique-related factors by training physicians, nurses, patients, and caregivers better. Dialysis centers have the important role of fostering expertise and experience in PD patient management. Dialysis reimbursement policy also can be helpful in providing sufficient incentives for choosing PD. However, despite successes in improving patient survival, PD treatment has limitations, notably the shortcoming of technique failure. Potential strategies to and challenges of implementing a PD-first policy globally are discussed in this review. We highlight 3 important elements of a successful PD-first program: nephrologist experience and expertise, peritoneal dialysis catheter access, and psychosocial support for PD patients.

Am J Kidney Dis. 62(5):993-1005. © 2013 by the National Kidney Foundation, Inc.

CONCLUSION

In conclusion, most observational data indicate that there is an initial survival advantage for patients with ESRD started on PD therapy. In this review, we have presented multiple benefits associated with a PD-first policy, which include preservation of residual kidney function, reduced infection risk, improved patient satisfaction, and lowered health care costs. However, controversy remains, and there are confounding factors with hemodialysis treatment, such as the mortality risk associated with central venous catheters. Several elements, including dedicated staff and expertise, PD access, psychosocial support, and prevention of severe peritonitis and technique failure, also are areas to focus on and to improve. Despite a reassuring patient survival trend on PD therapy, PD technique survival remains to be improved.

most observational data indicate that there is an initial survival advantage for patients with ESRD started on PD therapy.

these include

- ✓ preservation of residual kidney function
- ✓ reduced infection risk
- ✓ improved patient satisfaction
- ✓ lowered health care costs

of dialysis modalities vary in different countries. There are "peritoneal dialysis [PD] is recently, Jain et al³ studied 30 countries from 1996 to the number of PD patients in countries by 21.8 patients per 100,000 population. However, the rate of PD declined in developed countries, whereas in developing countries.³ This first policy should be advocated for successfully in-

developing countries. An important observation documented in these large-scale studies was the initial survival advantage of patients who received PD during their first 1-2 years of dialysis treatment.^{4,5,7,10}

From the Division of Nephrology, Carol and Richard Yu PD Research Centre, Department of Medicine and Therapeutics, Prince of Wales Hospital, Chinese University of Hong Kong, Hong Kong. Received December 6, 2012. Accepted in revised form March 19, 2013. Originally published online June 10, 2013.

Address correspondence to Philip Kam-tao Li, MD, FRCP, Department of Medicine and Therapeutics, Prince of Wales Hospital, The Chinese University of Hong Kong, Hong Kong. E-mail: philipli@cuhk.edu.hk

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